

Claims

1. Method for producing silicon nitride film by chemical vapor deposition, characterized by feeding gaseous aminosilane with formula (I)



(each R is independently selected from the hydrogen atom, C₁₋₄ alkyl, and the trimethylsilyl group and n is an integer with a value of 0-3, wherein the groups R are not all simultaneously a hydrogen atom)

and gaseous hydrazine compound with formula (II)



(each R¹ is independently selected from methyl, ethyl, and phenyl and x is an integer with a value of 0-4)

into a chemical vapor deposition reaction chamber that holds at least one substrate, and

forming silicon nitride film on said at least one substrate by reacting the two gases in the chemical vapor deposition reaction chamber.

2. The method described in Claim 1, characterized in that the reaction is run at temperatures of 300°C to 650°C.

3. The method described in Claim 1 or 2, characterized in that the pressure in the reaction chamber is established at 0.1-1000 torr.

4. Method as described in any of Claims 1-3, characterized in that the aminosilane : hydrazine compound molar ratio is 1 : 1 to 1 : 100.

5. Method for producing silicon oxynitride film by chemical vapor deposition, characterized by

feeding gaseous aminosilane with formula (I)



(each R is independently selected from the hydrogen atom, C₁₋₄ alkyl, and the trimethylsilyl group and n is an integer with a value of 0-3, wherein the groups

R are not all simultaneously a hydrogen atom),

gaseous hydrazine compound with formula (II)



(each R¹ is independently selected from methyl, ethyl, and phenyl and x is an integer with a value of 0-4), and oxygenated gas

into a chemical vapor deposition reaction chamber that holds at least one substrate, and

forming silicon oxynitride film on said at least one substrate by reacting these gases in the chemical vapor deposition reaction chamber.

6. The method described in Claim 5 for producing silicon oxynitride film, characterized in that the oxygenated gas is at least one selection from the group consisting of O₂, O₃, H₂O, H₂O₂, NO, NO₂, and N₂O.

7. The method described in Claim 5 or 6, characterized in that the reaction is run at temperatures of 300°C to 650°C.

8. Method as described in any of Claims 5-7, characterized in that the pressure in the reaction chamber is established at 0.1-1000 torr.

9. Method as described in any of Claims 5-8, characterized in that the aminosilane : hydrazine compound molar ratio is 1 : 1 to 1 : 100.

10. Method as described in any of Claims 5-9, characterized in that the aminosilane : oxygenated gas molar ratio is 1 : 1 to 1 : 100.